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AUTHOR Hickrod, G. Alan; And Others
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ABSTRACT

In the first section of this study, arguments for and against reward for local effort are presented along with brief summaries of some previous empirical studies on the subject. The second and third sections describe the methodology and the findings of a new empirical study that investigated the determinates of tax rate change in Illinois before the 1973 reform and after it. The study examines the impact of several socioeconomic variables--wealth, income level of residents, education level of residents, occupation of residents, percentage of population living in urban areas, percentage of nonwhite population, percentage of population between ages six and eighteen, percentage of owner-occupied housing, and existing operating tax rate--on changes in tax rates before and after the reform. Three empirical models were constructed for the research--the socioeconomic linear model, the socioeconomic interaction model, and the fiscal response model. Among the findings were that the amount of tax rate increase was lower after reform and that low income and low assessed valuation districts increased their tax rate by a smaller amount than the overall average. Numerous tables are included. (Author/IRT)

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REWARD FOR EFFORT IN ILLINOIS SCHOOL FINANCE:
Policy Debate, Empirical Evidence, Legislative Implications

G. Alan Hickrod
Ramesh Chaudhari
Ben C. Hubbard

Center for the Study of Educational Finance
Department of Educational Administration
College of Education and the
Graduate School

Illinois State University
Normal, Illinois, 61761

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G.A.H.
B.C.H.
R.C.

February, 1978

TABLE OF CONTENTS

	Page
Acknowledgments	i
SECTION	
I. BACKGROUND	1
Arguments Against Reward for Effort	4
Arguments for Reward for Effort	7
Previous Empirical Research	11
II. METHODOLOGY	22
The Questions	22
Empirical Models	23
Population	25
The Period	26
Sources of Data	26
Weights Used in the Analysis	26
III. FINDINGS	28
Elementary School Districts	28
High School Districts	33
Unit Districts	38
Summary of Empirical Evidence and Conclusions	43
Tables Relevant to Findings	45
IV. QUALIFICATIONS AND LIMITATIONS	64
V. LEGISLATIVE IMPLICATIONS	66
Notes and References	80
APPENDIX A: Definition of Terms	85
APPENDIX B: Descriptive Statistics of Selected Variables of Elementary School Districts, High School Districts, and Unit Districts	88

I. BACKGROUND

In the summer of 1973 the General Assembly of Illinois passed the first major legislative reform of its K-12 grant-in-aid system in forty-six years. This shift was from a "foundation" or "Strayer-Haig-Mort" grant-in-aid system to a system that gave districts a choice between the foundation program and a "guaranteed valuation" or "district power equalization" grant-in-aid system. The "DPE" in Illinois, however, has never carried any "recapture" provisions which might apply to wealthy districts, and thus may not qualify as a "true" district power equalization system among some purists.(1) There is an extensive literature which both describes the initial 1973 Act and the amendments which have been passed since that date. This literature also evaluated the 1973 Act in terms of certain goals or "criteria" that are held to be desirable by school finance "experts" throughout the United States, e.g., "fiscal neutrality" or "wealth neutrality," and "reduction of disparities in revenue per student between school districts," sometimes called "permissible variance." Readers completely unfamiliar with the Illinois funding system may wish to sample this literature concurrently with this study.(2)

The 1973 Act contained, along with several other provisions, a notion of "reward for effort." That is, all other things remaining equal, an Illinois school district that taxes itself more will receive more state aid than an Illinois school district that taxes itself less, at least up to certain tax limits set by the General Assembly. "Reward for effort" provisions have been relatively popular in state legislatures in recent years. For example, the state of Michigan passed a basically similar school finance system at exactly the same time as did Illinois. In Michigan the system is referred to as the "equal yield" formula, while in Illinois the new grant-in-aid formula was labeled the "resource equalizer" formula.(3) One recent tally puts the number of states with "reward for effort" provisions at about twenty.(4) It must be pointed out, however, that there is a considerable range among these twenty states. In some states the "reward for local effort" provision is nothing more than window dressing, often merely a "local enrichment" provision, while in other states the reward for local effort provision forms a very important part of the overall grant-in-aid system. The General Assembly of Illinois is now reconsidering or at least discussing the "reward for effort" provision of the 1973 law, and this study is intended to be of assistance in those deliberations.

In this background section we shall outline the arguments, pro and con, which can be found in school finance literature concerning "reward for local effort." In this section we shall also briefly summarize some previous empirical studies which cast some light upon this matter of fiscal policy. Having accomplished this task, we will then proceed to describe the methodology and the findings of a new empirical study which investigated the determinants of tax rate change in Illinois both before the 1973 reform, and then after the 1973 reform. Many of the twenty states which have a "reward for local effort" provision in their K-12 funding system do use some form of tax rate, usually the tax rate for operational purposes, as the measurement of "local effort" of a school district. It therefore becomes important to learn just what kinds of districts increase their tax rates under a DPE system, or a modified DPE system, as opposed to a foundation program. A basic assumption of this study was that the "response" of school districts under the DPE system would be different than the "response" of districts under the foundation system. "Response," of course, can be operationalized in several ways. Response might be studied in terms of tax rate referenda. This is a perfectly good way to approach the subject and may, in fact, yield better results than the response measurement we have chosen here, e.g., changes in

the operating tax rate. Fortunately, studies of referenda results by the Illinois Office of Education are under way, and these studies, when reported, may provide additional light on the "reward for effort" matter.(5) In the twenty-twenty of hindsight it is also clear that we need to qualify the basic assumption about response changes that would occur under a new grant-in-aid formula. These qualifications have chiefly to do with the amount of time that must pass before these new response patterns can be discerned. Finally, in keeping with the nature of the audience to whom this study is directed, we have included a "legislative implications" section which outlines some alternative actions the General Assembly of Illinois might take if it is determined that the present provisions of the law should be changed.

Arguments Against Reward for Effort

In spite of the fact that reward for effort provisions are found in some twenty states, the practice has never found favor among a number of professional students of the subject.(6) We find at least eight arguments presented against the notion of rewarding districts with more state aid for higher local tax efforts. They are as follows:

1. It is argued that all forms of local initiative systems may result in increased social stratification and geographic segregation of social classes as the different

social strata each seek the tax rate or the educational expenditure level that they prefer. Implicit or explicit in this argument is the fear that the wealthy will prefer higher tax rates and/or higher expenditures for education, while the poor may prefer lower tax rates and/or lower expenditures for education. It is further argued that the wealthy may, in fact, use the higher educational tax rates to keep the poor out of the district, in the same fashion that zoning restrictions and building codes are used for that purpose. High tax rates and high expenditure levels are then protective devices to keep out "the great unwashed" and to preserve what amounts to a private school which is publicly funded.

2. It is argued that local decision-makers may not, or cannot, meet the needs of their local districts, even if these needs clearly exist. This is a form of "under-consumption" of education argument. Two examples might serve to illuminate this argument. In rural areas strong agricultural representation on local boards of education has often kept tax rates down and might continue to keep them down in spite of the reward the state would offer for raising the rate under the new formula. Rural districts would then not profit as much under these reward for effort schemes as would suburban districts. Furthermore, in some states, the central city educational tax rate is depressed by the phenomenon of "municipal overburden," e.g., central cities' educational tax rate is kept low by the costs of noneducational municipal spending for police, fire, welfare, and so on. Therefore, the phenomenon of "municipal overburden" might keep the central cities from profiting as much from reward for effort as the suburban school districts.

3. It is argued that, in the long run, reward for effort provisions must stimulate local property taxation. It is admitted that the short run effects might indeed be local property tax relief, since those districts that tax more get more state dollars. However, in the longer run, a district earns more state dollars by convincing local constituents to vote a higher tax rate. Thus the long-run results are not local property tax relief; to the contrary, the system is engineered to increase the local property tax burden at least in those districts whose tax rate is below the maximum rate in the formula. Increasing the local property tax burden is not a politically attractive goal for most state legislators.

4. It is argued that, at least in the long run, it will be the districts with high income families that will raise their tax rates and their spending levels under DPE rather than districts with lower income families. Even if the system requires the wealthy district to provide 80 cents of the new tax dollar and the poor district to provide 20 cents of the new tax dollar, the poor district simply cannot fund the 20 cents of local contribution. It is also alleged that the 20 cents "hurts" the poor district more than the 80 cents "hurts" the rich district. If this is true, then reward for local effort is not compatible with equity goals such as "fiscal neutrality" or "wealth neutrality," or even with "reduction of revenue disparity between school districts." In the long run, it is argued, reward for effort cannot be reconciled with equalization of educational opportunity.

5. It is argued that a special problem exists for low income households located in property affluent school districts. Under a reward for local effort system the property wealthy district might decide to increase its generally low tax rate in order to obtain more state aid. The low income family living in the shadow of a factory or commercial complex would then find its residential property tax increased greatly. This special problem could be alleviated, however, by extending the "circuit breaker" provisions from the elderly to low income households.

6. It is argued that reward for effort provisions, when attached to a single public function such as education, may distort public spending in an uneconomical manner. Specifically, municipal authorities view these grants as encouraging local governments to spend funds on public education that might well need to go into other public services, such as health, sanitation, police, and fire. In more recent years the federal government has distributed its local revenue sharing partially upon a notion of local effort in the noneducational sector. Thus a reward for effort system operating in the educational sector could result in a showing of less effort in the noneducational sector and cost the municipality federal funds as well as local funds. At the very least, the adoption of reward for effort notions, in both the educational sector and the noneducational sector, sharpens the conflict between these sectors for public sector dollars.

7. It is argued that reward for effort grants may encourage the maintenance of small, inefficient school districts since the higher tax rates and/or the higher expenditure levels could be the result simply of diseconomies of scale. Thus the higher state payments to those districts with higher tax rates can be viewed, at least in part, as reward for inefficiency.

8. It is argued that finding a sound way to measure effort is just as difficult, if not more difficult, than finding a sound way to measure district wealth. Take two districts that have identical tax rates and therefore appear to exert identical effort to be rewarded by the state. If one of these districts assesses residential valuation at a lower fraction of full market value, has a higher percentage of its valuations in the form of industrial and commercial valuations, and has a higher median family income, that district has a distinct advantage over the district with the same tax rate but with none of these features. Assessment practices, ability of the district to "export" the tax, and differences in income levels all combine to assure that a $2.90 tax rate in one school district in Illinois does not have the same meaning as a $2.90 tax rate in another school district in the state, yet the current formula treats these districts as if they were exerting the same fiscal effort.

Arguments for Reward for Effort

This is a formidable array of arguments against the reward for effort provision. Why then have approximately twenty states built such a mechanism into their grant-in-aid system? Because there are also some strong arguments for having just such a provision. The most well known are as follows:

1. It is argued that this type of provision directly attacks the ancient equity problem in school finance that is at once both a taxpayer equity problem and a student equity problem. As early as 1905 Elwood Cubberly pointed out that two taxpayers, living in different school districts, might find themselves in

a situation where one taxpayer paid a higher tax rate and yet received a lower level of educational goods and services while another taxpayer paid a lower tax rate and yet received a higher level of goods and services. This violates the economic principle of the equal treatment of economic equals, as well as the legal principle of equal treatment under the law. The school finance litigation of the early 1970s simply highlighted an equity problem that has been known and investigated for over seventy years. When the state builds a system that provides "equal expenditure for equal effort" (the Illinois slogan) or "equal yield for equal effort" (the Michigan slogan), it speaks directly to this chronic problem in K-12 finance. Up to the limits specified in the law, a poor district can have the same level of educational goods and services as a rich district, if it is willing to exert the same fiscal effort as the rich district.

2. It is argued that a reward for effort system provides selective property tax relief, at least in the short run. Those districts which are taxing themselves more receive the greatest amount of state aid. This was an important argument in 1973 in the Illinois General Assembly. The General Assembly had passed and sent to the Governor a general property tax "freeze" similar to legislation in Indiana. The Governor had before him two incompatible bills. The 1973 reform offered more state funds to those districts that had been taxing more, e.g., "selective" relief, while a general tax freeze would have frozen in all the inequities in the system at one point in time. He signed the reform and vetoed the freeze. It would be more correct to say that reward for effort helps a high taxing district from moving to even higher levels of taxation. There is no way to move a tax rate back to lower levels under "reward for effort" provisions, unless the district is taxing beyond the maximum matching rate in the DPE formula. A district can do that only by giving up some of its state aid. The large state payments to high tax rate districts do provide a "breathing spell," however, since the increased state aid makes it unnecessary to obtain more funds on the local side.

3. It is argued that tax rates may be high in some districts for perfectly legitimate reasons that are as compelling as the diseconomies of scale matter, discussed earlier, are not compelling. For example, suburban areas have high tax rates at least partially

because the wave of migration to the suburbs has forced a heavy burden on school governments in those areas in the last two decades. While outward migration of business and industry to the suburbs has helped to alleviate this added tax burden, there is little doubt that at least some suburbs have needed more state help. This is particularly true of "workingmen's suburbs" and even of some middle class suburbs. These "dormitory" suburbs typically have large numbers of children to educate, but little by way of commercial or industrial valuation to tax. Dormitory suburbs are one of the principal beneficiaries under almost any kind of "reward for effort" provision. In the process some relatively wealthy suburbs may also be assisted, but increased state dollars will flow to the poorer suburban units. In Illinois terms, the 1973 reform was just as popular in southern Cook county as it was in northern Cook county. It is argued that the suburbs are where much of the education of students now takes place, and therefore this is where the state money should go.

4. It is argued that a "reward for effort" provision will help school districts to pass tax referenda. This is especially true in the property valuation poorer districts where it can be shown that small amounts of extra effort from the taxpayers in those districts can yield large amounts of extra state aid. Such an argument is, of course, less feasible in the richer districts. This argument assumes that local district superintendents and their boards know how the formula works and that state departments of education have made an attempt to explain the dynamics of the "reward for effort" provision to them.

5. It is argued that the system is deliberately engineered to keep local revenue an important part of the overall funding system for K-12 education. The system can be adjusted to provide higher percentages of state aid and to shift the major burden for supporting the schools away from the local tax base to the state tax base, but the "reward for effort" provision also insures that there will always be some local revenue in the system. Those who support "full state assumption" of all educational costs would, of course, accord this a weakness rather than a strength. Since the combined level of state and local resources rests so strongly upon the selection of the tax level by local voters the system can be thought of as strengthening local control

rather than decreasing local control. In fact, some have referred to DPE as "local control with a vengeance."

6. It is argued that the situation relative to reorganization and consolidation is not so dismal as the opponents would have one believe. For a very long time reorganization and consolidation of school systems has been slowed by the fact that wealthier districts did not wish to accept the higher tax rates that inevitably came with the absorption of their poorer neighbors. Under DPE or some other form of reward for effort these higher tax rates are less of a problem.

7. It is argued that there is nothing wrong with keeping some amount of consumer preference in the system. In all other areas of the economy the consumer is allowed to choose the amount and quality of goods and services he or she might like. Granted districts may be prevented by the state from buying a "rickshaw" education, but the state should not prevent one district from buying a Ford education rather than a Cadillac education, if that is all they want for their children. Above some "floor," which the state must require, local taxpayers should have the right to select the amount and quality of public education they desire. Reward for effort provisions allow that discretion and they also enable the tax poor district to afford the Cadillac education at the same tax rate as the rich district.

8. Acceptance of the reward for effort provisions does mean acceptance of a certain amount of inequality in revenue levels between school districts. This is so if only because one can not assume that consumer preferences are all alike. However, allowing some school systems to spend more than others is not all that bad. For decades, schoolmen have encouraged the richer districts to spend somewhat more than the poorer districts and then used that higher spending level to "lever up" their own spending levels. This "demonstration effect" or "keeping up with the Joneses" is preserved in reward for local effort systems. All that DPE does is allow the poorer districts to participate in this business of emulation of the wealthier and higher-spending districts.

The foregoing scholastic exercise is helpful in making the policy issues stand out in stark relief. It

could be misleading in one respect, however. The practical legislative situation may not be one of no reward for effort versus a lot of reward for effort. Indeed, as we suggested previously, the situation in most states is to have "some" amount of reward for effort. Grant-in-aid systems that are discussed under the heading of "mixed models" or "multiple stage models" frequently afford the opportunity for a state to have a limited amount of reward for effort without making that provision the keystone of the entire grant-in-aid system.(7) A frequently recommended grant system in recent years, for example, is one which features a relatively high foundation program with a small amount of reward for effort operating over the top of the foundation program.(8) Usually this system is also adjusted by pupil weightings to meet individual educational needs. We have discussed this model elsewhere as a possibility for future legislative action in Illinois.(9)

Previous Empirical Research

What is available beyond the "conventional wisdom" expressed in the previous section? Some nine years ago Johns and Kimbrough pointed out that in Illinois and Kentucky there was a positive linear relationship between district income and district tax effort; that is, the rich districts exerted the greater fiscal effort and the poorer

districts exerted the lower fiscal effort.(10) In the Center's first evaluation of the 1973 reform, after only one year of experience, the same positive relationship between family income and tax effort was again noted.(11) Gensemer has demonstrated that in Ohio there is a strong relationship between median family income and educational tax rate. To be specific, Gensemer found that each additional $100 in 1969 median family income was related, on the average, to an additional 0.14 mills on a school district's 1975-76 school operating millage rate.(12) Gensemer's model was multivariate in nature and income was the best predictor of local tax rates. In Illinois, Yang and Chaudhari have also shown that low income is associated with medium to low effort, while high income, along with high educational attainment, high occupational status, and high residential housing value are associated with high property tax effort.(13) The Yang and Chaudhari data suggest that these relationships are stronger for dual districts (separate elementary and high school districts) than for K-12 districts. Unfortunately, all the studies we have examined concerning the correlates and determinates of tax rates are cross-sectional in nature, that is, the variables are measured at one point in time. The response of districts to new grant-in-aid systems, however, is a dynamic affair, not a static phenomenon. To provide

convincing evidence on the relationship of wealth and other variables to tax rate change, we need to explore the relationship of wealth and other variables, not to tax rates at one point in time, but rather to changes in tax rates through time. We also need to compare tax rate changes under one type of grant-in-aid system with tax rate changes under another type of grant-in-aid system. The empirical research reported later attempts to meet these needs.

The limited empirical evidence that does exist seems to lend support to arguments one and four against the reward for effort provision. However, the issue is far from closed, and the effect of the newer forms of DPE grants-in-aid in education is still quite controversial. For example, at least one economist believes that the DPE systems can achieve any degree of wealth neutrality the state legislature desires by subsidizing the price of education in the poorer districts. Hopefully the poor districts will then purchase as much education as the wealthier districts. In fact, Feldstein concludes that DPE systems might even go beyond wealth neutrality to a condition where revenues would be inversely related to wealth.(14) Such a condition would be "compensatory" education in a true sense, e.g., poor districts would have more spent on them than wealthy districts. Unfortunately, the possibility

that wealthy districts might value education very highly, and poor districts might value education very little, is not given much consideration in the Feldstein models. If the present demand schedule strongly favors wealthy districts, then price subsidization to the poor must be extreme in order to induce them to purchase more of a service for which they see no great need.

We should perhaps leave the appreciation of changes in demand schedules and utility schedules to those whose prior training has better prepared them for these refinements than our own. In any event, we have enough problems squaring some of the empirical research on tax effort with the evaluations of the 1973 Illinois reform the Center has carried out in the last several years.(15) On the whole, these evaluations have been favorable to the 1973 reform. For example, the evidence does show a reduction in the disparity between school districts in revenue per pupil. The trend is more marked in unit districts and high school districts than in elementary districts, but there is evidence of reduction in variance in revenue per pupil in all three populations of districts. If one concentrates on the variation below the median revenue, then the evidence indicates progress in moving up the low spending unit districts and high school districts, but there appears to be no such progress for low spending elementary districts.

The findings with respect to the attainment of "fiscal neutrality" or "wealth neutrality" are also reassuring. This is especially the case when the evaluation using gross wealth elasticities is used. In all three categories of districts in Illinois--units, elementaries, and high schools--there is evidence of movement toward wealth neutrality. This is especially true in unit districts where the magnitude of the slope of the regression line between property valuations per pupil and revenues per pupil has been cut in half within three years from the initial reform legislation. The evidence using income as a wealth specification rather than property valuation is not so regular as the property valuation results, but the third year's regression values are all less than the base year and thus support in general the property valuation results. Tests made with the Gini index and Lorenz curves are also generally supportive of the results achieved with the gross wealth elasticities, but there are problems in the use of the Gini-Lorenz procedures. Essentially, these problems have centered around the fact that Chicago appears relatively wealthy in terms of median family income, or even income per weighted pupil, and thus state aid to Chicago is registered as aid to wealthy students on the Gini-Lorenz technique.(16) Regardless of qualifications and technicalities, however, there was a systematic

improvement in the Illinois showing on equity criteria for at least three years after the 1972-73 reform.

Do the results of the Center's evaluations for each of three years after the reform of 1973 prove conclusively that those who contend that "reward for effort" is not compatible with "equalization of educational opportunity" are wrong? We think not. There are at least three reasons why the state of Illinois could continue to show progress toward equity goals after the adoption of a modified DPE system in 1973 in spite of any adverse effects on equity goals by the "reward for effort" provision. In the first place, the evaluations of the 1973 reform conducted by the Center are evaluations of the entire general purpose grant-in-aid system. The "reward for effort" provision is just one part of a relatively complicated grant-in-aid system. Illinois school districts can receive state funds under no less than four different computational procedures in the general purpose aid system alone. Some of the provisions in the general purpose grant-in-aid work against other provisions relative to the attainment of overall equity goals such as "wealth neutrality." To cite only one example, the relatively heavy weighting in the Illinois system given to title one eligibles, e.g., children from lower socio-economic families, provides for a different distribution

of state funds than does the provision that sends state funds to districts with high tax rates. Recent calculations by Ben C. Hubbard indicate that it would take only seventy-four million in new state dollars to remove the differential effects of the "reward for effort" provision from the present formula.

Second, it must be remembered that improvements in equity goals are not so much a matter of formula technicalities, as they are a matter of the fundamental shift from local revenues to state revenues to support K-12 education. In the period between 1972-73 and 1975-76 the state of Illinois increased the state revenue contribution to general purpose K-12 educational funding by almost three hundred and seventy-one million dollars, pushing the percentage of state support to an all-time Illinois high of 48.36 per cent. The formula would have had to have been badly malfunctioning indeed not to show a gain on equity goals given that amount of revenue input by the state government. There has since been a deterioration in the percentage of costs supported by the state revenues as opposed to local and federal revenues, but the decline has not been serious enough, at least as of this date, to threaten all the equity gains made for three years after the reform.(17) Thus any negative effects on equity that might have been attributable to the reward for effort

provision were simply washed away in the floor of new state aid. It should be pointed out that this possibility was outlined for the authors of this study in a letter to them from Professor R. L. Johns of the University of Florida in early 1976.(18)

Finally, there is the complicated matter of the time it takes for a reward for effort provision to manifest itself in the new allocation system. We shall return to this point in the qualifications and limitations section of the empirical study reported next. Essentially, however, the presence of three hundred and seventy-one million new state dollars, an increase of 46 per cent in state aid, provided a "cushion" for many school districts so that they did not have to go to the local voters for new local resources in the three years after the reform. Thus there was no real need for either wealthy or poor districts to reveal their true preferences for K-12 spending levels. In the terms of the market analysts there were probably too few transactions during this three-year period after the reform to "fully test the market." Similarly, in the terms of the economists there were too few transactions to fully reveal the true shape of the demand schedule. Only now, some five years after the reform, are districts being called upon to go to their voters for new tax referenda. We speak of course in

general terms since many individual school districts did attempt tax referenda during the three-year period after the 1973 reform. There is a sense in which the true effects of DPE or reward for effort might only be revealed some seven or eight years after the initial 1973 reform. During the first four or five years the increases in state aid caused by "phasing-in" the formula tend to cover up the effects on equity of individual district preferences for different tax rates. Only after the formula has been "fully funded" and left in place for one or two years would the consumer preferences for different tax rates be fully revealed.

There also appears to be some problem of comprehension by many local boards and local superintendents that the funding system dynamics were drastically altered in 1972-73. Perhaps this is understandable after forty-six years of operating under a foundation system. Whatever the reasons, it is clear that at least some local boards and local superintendents did not, and do not, realize that under DPE, or any other form of local initiative system, the district has to "do" something, in order to gain more state aid; namely, pass tax referenda. The fundamental difference between the foundation system and the local initiative systems, no matter what they are called, "equal yield, resource equalizer, percentage

equalization, and so on," is that under the foundation system the districts had to do absolutely nothing to gain more state aid. The local board simply waited for the General Assembly to raise the foundation level, assuming of course that they had levied the necessary qualifying tax rate to participate in the foundation program. They could spend most of their efforts lobbying in Springfield for higher foundation levels rather than trying to pass tax referenda at the local level. That world changes when a local initiative system becomes law. Under the local initiative type of grant-in-aid the race definitely goes to the strong--those that can pass the referenda. Since we have at least a few examples of districts that have reduced their tax rates and therefore lost state aid, we must conclude that there are still local boards and local superintendents that do not understand the dynamics of the system some five years after the reform. The system was never intended to give absolute tax relief, only relative tax relief. If a local district reduces its tax rate, then it must expect to lose state aid, all other things remaining equal. Under local incentive forms of grants-in-aid the district must "earn" all increments of state aid; under the foundation system they are largely "unearned." Of course the state has the option of giving all districts "unearned" increments of state aid in the DPE

systems as well, if they are willing to constantly escalate the parameters in the grant-in-aid formula. This is one reason why escalating the guaranteed valuation or adjusting the combined state-local figure of $1,260 upward is so popular among many school districts; it results in "unearned" state aid gains to all school districts. If the parameters were left constant for any appreciable length of time, the only increments of state aid that could take place would be from increasing numbers of pupils, decreasing valuations, increasing percentages of title one eligibles, or the painful process of passing local tax referenda. For districts at or above the maximum tax rate that the state will match, and there are an increasing number of these in Illinois, even passing the referenda will result in only local revenue gains, not state aid gains. Having provided this background on the fiscal policy debate, we turn now to the empirical study to be reported.

II. METHODOLOGY

A. The Questions

The design of research in this study was oriented toward answering the following questions.

1. How did the changes in tax rates before the 1973 reform compare with those after the 1973 reform?

2. What was the impact of the following socio-economic variables on changes in tax rates before the 1973 reform and after the 1973 reform?

   (a) Wealth (equalized assessed valuation/pupil)
   (b) Income level of residents
   (c) Educational level of residents
   (d) Occupation of residents
   (e) Percentage of population living in urban areas
   (f) Percentage of non-white population
   (g) Percentage of population age 6-18
   (h) Percentage of owner occupied housing
   (i) Existing operating tax rate.

Further specifications of these variables are found later in this study.

3. Was there any interaction effect of the income variable and the equalized assessed property variable

(wealth) on changes in tax rates? In other words, did districts with particular combinations of income and property valuations behave differently than others?

4. What was the effect of changes in school finance variables such as enrollment, tax base, state aid, and total revenues on changes in tax rates before and after the 1973 reform?

B. Empirical Models

The following three empirical models were constructed to facilitate the research.

1. The Socio-economic Linear Model: In this model change in tax rate was treated as a dependent variable expressed as a linear function of the socio-economic variables mentioned in the second question above. Two separate regression equations were used for before and after reform tax rate changes for each type of school district. Multivariate regression analysis was used to determine the regression coefficients.

2. Socio-economic Interaction Model: Two-way analysis of variance was used to answer questions regarding the interaction of property valuation and income. Wealth (property valuation) and income variables were recoded into three categories--low, medium, and high. For example, districts that were half a standard deviation

below weighted average income were classified as low income districts, those half a standard deviation above were classified as high income districts, and the rest were classified as medium income districts. A similar classification technique was used for the wealth variable. Equalized assessed valuation per pupil was used as a measure of wealth and median family income was used as a measure of income.

3. The Fiscal Response Model: In this model change in tax rate was expressed as a linear function of changes in fiscal variables--the variables that directly affect the operating revenues. Mathematically, the model may be expressed as:

$$\Delta TAX = f\ (\Delta TW/TW, \Delta WLTH/WLTH, \Delta AID/REV, \Delta REV/REV)$$

where

ΔTAX = Change in tax rate

$\Delta TW/TW$ = Percentage change in weighted pupil count

$\Delta WLTH/WLTH$ = Percentage change in per pupil equalized assessed valuation

$\Delta AID/REV$ = Percentage change in total revenues due to increase in state aid

$\Delta REV/REV$ = Percentage change in total revenues.

The term "total revenues" in this study means the sum of local and general state revenues. No revenues from state categorical grants and no federal revenues have been

included. This is the specification of revenues used in all other Center studies referenced earlier in this study. The dependent variable, "change in tax rate" is the actual change in the tax rate for operating purposes. This measurement was selected since this was the definition of "effort" used in the 1973 reform. Multiple regression analysis was used to determine the impact of these variables on changes in tax rates before and after reform. Two separate regression equations were used for before and after reform changes in tax rates for each type of school district.

C. Population

All school districts that were receiving state aid through the resource equalizer formula in 1976 were included in the study. Since the major thrust of this study was to explore the response of districts to the reward-for-effort provision in the new grant-in-aid system, it was necessary to leave the districts that receive state aid through the Strayer-Haig formula out of this study. It must be pointed out that most of the districts left out are wealthy districts. However, they represented only about 7 per cent of the total pupil count in the state.

Because of the existence of three different types of school districts, there were three different populations.

A separate analysis was performed for each type of school district.

D. The Period

Throughout this report the terms "before reform" and "after reform" have been used. The term "before reform" refers to the period 1970-73 and the term "after reform" refers to the period 1973-76.

E. Sources of Data

Fiscal data for the three fiscal years--1970, 1973, and 1976--were obtained from the Illinois Office of Education. Data for socio-economic variables such as income, education, occupation, and so on were obtained from the 1970 federal census of population and housing. The 1970 census tapes for Illinois school districts have been adjusted and refined by the Department of Sociology at Illinois State University under the supervision of Professor Vernon Pohlmann.

F. Weights Used in the Analysis

All the analysis was performed using pupil as a unit of analysis. Consequently, each district was assigned a weight equal to the total weighted pupil count for that district. The major advantage of this technique is that it takes into account the size of the district.

This is particularly helpful in descriptive analysis and in policy analysis. An argument can be made that under the "one man, one vote" legal dictum, all descriptive statistics in school finance should be so weighted since larger districts can be presumed to have more influence in the political economy than smaller districts. The procedure results in artificially increasing the number of cases which makes it very difficult to interpret the results of significance tests. However, where populations of data are involved, as was the case in this study, significance tests are irrelevant. The focus in this study was on describing the population and in our opinion weighted analysis would give a more representative description of the population than unweighted analysis in which a large district such as Chicago carried the same weight as any other district. However, we must caution against using this technique where the data for the population are not available and the results obtained from sample data must be extrapolated to draw conclusions about the population.

III. FINDINGS

The results of the analysis are presented in the following three sections for elementary, high school, and unit districts respectively. In each case the findings for the socio-economic linear model are reported first, the socio-economic interaction model second, and finally the fiscal response model.

Elementary School Districts

Results of analysis for elementary school districts are presented in Tables 1.1 to 1.6.

Socio-economic Linear Model

Relationships of various socio-economic variables with the changes in tax rates in elementary school districts before and after reform are shown in Tables 1.1 and 1.2 respectively. The following discussion refers to these tables.

Effect of Income:

Four measures of income included in the model were median family income, per capita income, per cent of families over $25,000 income, and per cent of families

under $5,000 income. Comparisons of Beta values (standardized regression coefficients) show that per capita income was an important factor (Beta = .448) before reform and that districts with higher per capita income tended to raise their tax rates. Beta values for other income measures as shown in Table 1.1 are relatively small (less than .1). However, after the reform, relationship between per capita income and change in tax rate weakened (Beta = .128). Table 1.2 also shows that the per cent of families over $25,000 income had a negative impact on tax rate changes after reform.

Effect of Education:

Two measures of education level of the residents of school districts were included in the model; per cent of adult (25 or over) population with college education and per cent with below elementary education. Per cent of college educated population was a negative factor in raising tax rates before reform (Beta = .124). However, it was a positive factor in raising tax rates after reform (Beta = .329), as shown in Table 1.2. Per cent of population with less than elementary level education had little impact on tax rates before reform and negative impact after reform (Beta = -.105).

Effect of Occupation:

Table 1.1 shows that per cent of employed population in professional and managerial occupation had a strong positive impact on tax rate changes before reform (Beta = .498). However, the same variable showed little or no impact on tax rate changes after reform. Per cent of blue collar workers affected tax rate changes before and after reform in the positive direction.

Effect of Percentage of Owner Occupied Housing:

This variable with Beta equal to -.215 was an important factor before reform as well as after reform (Beta = -.101). Districts with higher percentage of owner occupied housing tended to increase their tax rates by smaller amounts or were more inclined to decrease the tax rates before and after reform.

Effect of Operating Tax Rate:

Districts with high tax rates were strongly inclined to reduce their tax rates after the reform (Beta = -.430). This tendency was not nearly as strong before reform. Level of the operating tax rate in 1973 was the biggest single factor affecting change in tax rate after reform.

Other Variables:

Equalized assessed valuation per pupil, per cent of population age 6 to 18, and per cent of non-white population were also included in the socio-economic model for elementary school districts. However, none of these variables showed much effect on changes in tax rates before or after reform.

Socio-economic Interaction Model

A two-way analysis of variance was conducted using tax rate change as a criterion variable and equalized assessed valuation per pupil and median family income as the two main factors.

In Tables 1.3 and 1.4 are displayed the weighted means of changes in tax rates before and after reform for nine groups of elementary school districts sorted by combinations of low, medium, and high values of equalized assessed valuation and median family income. Before reform, the biggest increases in tax rates were in high wealth, medium, and high income elementary school districts. The smallest increase in tax rates before reform were in low or medium wealth, high income school districts.

Means of after reform changes in tax rates are displayed in Table 1.4. The biggest increases in tax rates after reform were in high wealth, low income districts and

medium wealth, low and medium income districts. The reductions in tax rates were only in low and medium wealth, high income groups of elementary school districts.

Fiscal Response Model

Results of regression analysis using fiscal response model are presented in Tables 1.5 and 1.6.

Effect of Per Cent Change in Pupil Count:

Changes in weighted pupil count were negatively associated with changes in tax rates before reform. However, after reform the growth in weighted pupil count was positively associated with rising tax rates. In other words, before reform, districts with declining enrollments tended to raise their tax rates, but after reform they tended to lower the tax rates.

Effect of Per Cent Change in Per Pupil Wealth:

Before and after reform, elementary districts with high percentage increases in equalized assessed valuation per pupil had a tendency to lower the tax rates.

Effect of Per Cent Change in Revenue Due to State Aid:

Both before and after reform, elementary districts with high percentage increase in total revenues per pupil

due to increase in state aid showed a tendency to lower the operating tax rates.

Effect of Per Cent Increase in Total Revenue:

Per cent increase in total revenue was positively associated with increase in tax rates before and after reform. However, the relationship was weaker in the after reform period.

High School Districts

Results of analysis for high school districts are presented in Tables 2.1 to 2.6.

Socio-economic Linear Model

Results of regression analysis for socio-economic linear model for high school districts are presented in Tables 2.1 and 2.2. The effects of various socio-economic variables on changes in tax rates before and after reform are as follows.

Effect of Income:

Before reform high school districts with high median family income and those with high per capita income increased their tax rates more than the districts with low median family income or per capita income. Higher

percentages of families with high income (over $25,000) had a negative impact on tax rates. Also, higher percentages of low income families (under $5,000) had a negative impact on tax rates before reform.

After reform relationships of various measures of income with tax rates were somewhat mixed. Median family income and per capita income showed exactly opposite effects on tax rate changes. Table 2.2 shows that high median family income in high school districts helped to increase tax rates. A high percentage of low income families was associated with reduction in tax rates after reform just as it was before reform. However, a higher percentage of high income families showed positive impact on tax rates after reform whereas it had negative impact before reform.

Effect of Education:

Higher percentage of college educated adults was associated with tax rate increase before reform. This effect was substantially weakened in the after reform period. However, the negative impact of percentage of low education (elementary or less) families on high school district tax rates was stronger in the after reform time period.

Effect of Occupation:

Higher percentages of professionals and blue collar workers were associated with decline in tax rates before reform, and these relationships became stronger after reform.

Effect of Owner Occupied Housing:

This variable was an important factor affecting negatively the tax rate changes after reform although it did not have much impact on tax rate changes before reform. After reform, higher percentage of owner occupied housing was associated with decline in tax rates among high school districts.

Effect of Population
Age 6 to 18:

This variable showed strong negative impact on tax rate increase before and after reform.

Effect of Operating Tax Rates:

In both before and after reform periods high school districts with high operating tax rates showed a strong tendency to decrease the tax rates rather than increase them.

Effect of Other Variables:

The negative relationship between tax rate increase and equalized assessed valuation per pupil became stronger in the after reform period. The positive relationship between tax rate increase and non-white population changed into a weak negative relationship. The negative impact of percentage of urban population on tax rates became weaker after reform.

Socio-economic Interaction Model

Weighted group means of changes in tax rates in high school districts before reform are presented in Table 2.3. The biggest increases in tax rates before reform were in two groups--one with high wealth and low income and the other with high wealth and high income. The smallest increase in tax rate was in the low wealth, low income group. One group with medium wealth and medium income showed a slight reduction in tax rates before reform.

Table 2.4 shows that after reform there was an overall reduction in tax rates in high school districts. The biggest reductions were in low or medium wealth and high income groups. Two groups showed increased tax rates after reform. These were the high-wealth-high-income and high-wealth-low-income groups.

Fiscal Response Model

Results of the analysis of changes in tax rates of high school districts using the fiscal response model are presented in Tables 2.5 and 2.6.

Effect of Per Cent Change in Pupil Count:

This variable showed no effect on changes in tax rates before reform. After reform, increase in pupil count was associated with small increase or reduction in tax rates.

Effect of Per Cent Increase in Wealth:

Per cent increase in equalized assessed valuation per pupil had a strong negative impact on increase in tax rates before reform. The impact, although negative, was reduced in strength after reform.

Effect of Per Cent Increase in Revenue Due to State Aid:

The substitution effect of increased state aid in reducing tax rate increases was stronger before reform than after reform.

Effect of Per Cent Increase in Total Revenue:

The tendency to increase tax rates to support increases in per pupil expenditures was stronger before

reform than after reform.

Unit Districts

Results of the analysis of tax rate changes before and after reform in unit districts are presented in Tables 3.1 to 3.6.

Socio-economic Linear Model

Results of multiple regression analysis for socio-economic linear model of tax rate changes before and after reform are shown in Tables 3.1 and 3.2. The effects of various socio-economic variables on changes in tax rates are described in the following.

Effect of Income:

Different measures of income show different impact on tax rates in unit districts. Median family income had a positive relationship with tax rate increases before reform and this relationship was even stronger after reform. Per capita income, on the other hand, had a weak negative relationship with changes in tax rates before reform and that negative relationship became stronger after reform. High percentage of families with income over $25,000 was associated with high amounts of increases in tax rates before reform, but this relationship was reversed after reform. Per cent of families below $5,000

income had little impact on changes in tax rates before reform but had a positive relationship with changes in tax rates after reform.

Effect of Education:

High percentage of adults with college education was associated with high increments in tax rates before reform and the effect was opposite after reform. But, these relationships before and after reform were relatively weak. Percentage of adults with elementary or less education had a strong positive relationship with increase in tax rates before reform, but the relationship in the after reform period was substantially weaker.

Effect of Occupation:

High percentage of blue collar workers was associated with high amounts of increase in tax rates before reform but the effect was exactly opposite in the after reform period. Percentage of professional people did not seem to have any effect on changes in tax rates before or after reform.

Effect of Owner Occupied Housing:

In unit districts, this variable had a strong negative impact on tax rate increases before reform, but it changed into a positive factor after reform.

Effect of Population
Age 6 to 18:

After reform, unit districts with high percentage of school age population resisted tax rate increases, whereas before reform percentage of school age population had no impact on tax rate changes.

Effect of Operating Tax Rates:

Unit districts with high operating tax rates opposed increases in tax rates before and after reform. This tendency was particularly strong in the after reform period.

Effect of Non-White Population:

High percentage of non-white population was associated with small increases or reductions in tax rates before reform, but the relationship reversed in the after reform period and high percentage of non-white population was associated with high amounts of tax rate increase after reform.

Effect of Wealth:

Equalized assessed valuation per pupil had a weak negative relationship with tax rate changes before reform. But it had a positive impact on increase in tax rates after reform.

Effect of Urban Population:

Before reform urban unit districts had relatively smaller increments in tax rates. After reform, urban unit districts had larger increments in tax rates or had smaller reductions.

Socio-economic Interaction Model

Table 3.3 shows that before reform, there was a substantial increase in tax rates in most of the districts. The biggest increase in tax rates was in the medium-wealth-medium-income group. The smallest increase was in the high-wealth-medium-income group. The tax rates in high-wealth-high-income group actually declined during the period before reform.

Table 3.4 shows that the tax rates in unit districts generally increased to a smaller extent after reform. The largest gains were in districts with high wealth and medium income and those with high wealth and high income. The smallest increase in tax rates was shown by districts with medium wealth and medium income and those with low wealth and high or medium income.

Fiscal Response Model

Results of the analysis of changes in tax rates of unit districts using the fiscal response model are

presented in Tables 3.5 and 3.6.

Effect of Per Cent Change in Pupil Count:

Per cent change in pupil count had very little impact on change in the rates before or after reform.

Effect of Per Cent Increase in Wealth:

There was a strong negative relationship between per cent change in equalized assessed valuation per pupil and increase in tax rate before reform. After reform the relationship was negative and weak.

Effect of Per Cent Change in Revenues Due to Change in State Aid:

Increased state aid resulted in local tax relief for unit school districts either in the form of actual reductions in tax rates or smaller increases before and after reform.

Effect of Per Cent Change in Revenue:

Need to maintain or increase expenditures per pupil was a strong positive factor in increasing tax rates by higher amounts before reform. However, the impact was not quite so strong in the after reform time period.

Summary of Empirical Evidence and Conclusions

From the empirical evidence described in previous sections the following conclusions are drawn:

1. The amount of increase in tax rate was lower after reform than it was before reform. Additional evidence is shown in Table 4.1.

2. Districts with high tax rates increased their tax rates by smaller amounts than districts with low tax rates. This tendency was stronger in the after reform period.

3. From the cross-classification tables it is clear that districts with high equalized assessed valuation per pupil increased their tax rates by greater amounts than those with low property valuations.

4. From the cross-classification tables in the following section it may be concluded that the districts in the category of low income and low assessed valuation increased their tax rates by smaller amounts than the overall average.

5. From the results of the socio-economic linear model it seems that income, education, and occupation were important determinants of tax rates. However, no clear pattern of the impact of these variables on tax rate changes can be established from these results.

6. From the fiscal response model it may be concluded that increase in property valuation and substantial increase in state aid tend to put downward pressure on local tax rates, while increase in expenditures tends to put upward pressure on tax rates.

7. The effect of change in enrollment on change in tax rate was mixed. In elementary districts increases in enrollment helped increase tax rates, while in high school districts it had the opposite result and in unit districts it had little effect on changes in tax rates.

TABLE 1.1

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
ELEMENTARY SCHOOL DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
BEFORE REFORM

Variables	Regression Coefficient	BETA
Median Family Income	0.000229	0.00558
Per Capita Income	0.053980	0.44814
Per Cent Urban Population	-0.000842	-0.17441
Per Cent Over $25,000 Income	0.01058	0.00662
Per Cent Under $5,000 Income	0.155905	0.08299
Per Cent Over College	-0.16712	-0.12353
Per Cent Under Elementary	0.043386	0.03328
Per Cent Professional	1.089616	0.49835
Per Cent Blue Collar Workers	0.315712	0.31308
Per Cent Non-White	0.039032	0.03417
Per Cent Children	0.113461	0.01782
Per Cent Owner Occupied Housing	-0.248942	-0.21524
Operating Tax Rate at the Beginning of the Period	-0.012134	-0.03128
EAV/TWADA Beginning of the Period	-0.248942	-0.21524

TABLE 1.2

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
ELEMENTARY SCHOOL DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
AFTER REFORM

Variables	Regression Coefficient	BETA
Median Family Income	0.000959	0.02091
Per Capita Income	0.017251	0.12789
Per Cent Urban Population	-0.000440	-0.08150
Per Cent Over $25,000 Income	-0.245168	-0.13696
Per Cent Under $5,000 Income	-0.071676	-0.03407
Per Cent Over College	0.498161	0.32882
Per Cent Under Elementary	-0.154048	-0.10551
Per Cent Professional	-0.055636	-0.02272
Per Cent Blue Collar Workers	0.305991	0.27097
Per Cent Non-White	-0.033364	-0.02608
Per Cent Children	-0.286559	-0.04020
Per Cent Owner Occupied Housing	-0.130928	-0.10109
Operating Tax Rate at the Beginning of the Period	-0.166996	-0.43047
EAV/TWADA Beginning of the Period	-0.130928	-0.10109

TABLE 1.3

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME
ELEMENTARY SCHOOL DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
BEFORE REFORM

Income	Wealth			Row Means
	Low <23,093	Medium	High >32,685	
Low <11,404	0.0770(110)[a]	0.0455(49)	0.0726(47)	.0636
Medium	0.0725(39)	0.0796(43)	0.1680(30)	.0996
High >14,781	0.0207(03)	0.0421(17)	0.1648(22)	.0934
Column Means	.0727(152)	.0596(109)	.1484(99)	.0870

[a]Numbers in parentheses equal number of districts in the group.

TABLE 1.4

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME
ELEMENTARY SCHOOL DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
AFTER REFORM

Income	Wealth			Row Means
	Low <23,093	Medium	High >32,685	
Low <11,404	0.0584(110)[a]	0.0889(49)	0.1467(47)	.0852
Medium	0.0331(39)	0.0860(43)	0.0620(30)	.0615
High >14,781	-0.0005(03)	-0.0187(17)	0.0193(22)	-.0016
Column Means	.0430(152)	.0591(109)	.0636(99)	.0553

[a]Numbers in parentheses equal number of districts in the group.

TABLE 1.5

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
ELEMENTARY SCHOOL DISTRICTS
FISCAL RESPONSE MODEL
BEFORE REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	-0.000565	-0.06129
Per Cent Change in Wealth	-0.001082	-0.16781
Per Cent Increase in Revenue Due to Increase in State Aid	-0.002376	-0.22052
Per Cent Increase in Revenue (State and Local)	0.000405	0.15453

TABLE 1.6

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
ELEMENTARY SCHOOL DISTRICTS
FISCAL RESPONSE MODEL
AFTER REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	0.002431	0.14743
Per Cent Change in Wealth	-0.001226	-0.14963
Per Cent Increase in Revenue Due to Increase in State Aid	-0.001545	-0.14785
Per Cent Increase in Revenue (State and Local)	0.000158	0.08930

TABLE 2.1

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
HIGH SCHOOL DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
BEFORE REFORM

Variables	Regression Coefficient	BETA
Median Family Income	0.043971	0.74861
Per Capita Income	0.023553	0.14565
Per Cent Urban Population	-0.000822	-0.10515
Per Cent Over $25,000 Income	-1.764772	-0.85699
Per Cent Under $5,000 Income	-0.204458	-0.07142
Per Cent Over College	1.443907	0.79863
Per Cent Under Elementary	-0.053271	-0.02837
Per Cent Professional	-1.270179	-0.41126
Per Cent Blue Collar Workers	-0.229395	-0.16478
Per Cent Non-White	0.464670	0.14704
Per Cent Children	-2.273151	-0.22193
Per Cent Owner Occupied Housing	-0.012215	-0.00637
Operating Tax Rate at the Beginning of the Period	-0.358281	-0.65295
EAV/TWADA Beginning of the Period	-0.001212	-0.09295

TABLE 2.2

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
HIGH SCHOOL DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
AFTER REFORM

Variables	Regression Coefficient	BETA
Median Family Income	0.038723	1.07836
Per Capita Income	-0.124988	-1.26427
Per Cent Urban Population	-0.000104	-0.02185
Per Cent Over $25,000 Income	1.74240	0.93271
Per Cent Under $5,000 Income	-0.075513	-0.04315
Per Cent Over College	0.081260	0.07352
Per Cent Under Elementary	-0.278044	-0.24222
Per Cent Professional	-1.406107	-0.74468
Per Cent Blue Collar Workers	-0.205193	-0.24110
Per Cent Non-White	-0.122068	-0.06318
Per Cent Children	-2.328886	-0.37191
Per Cent Owner Occupied Housing	-0.348085	-0.29679
Operating Tax Rate at the Beginning of the Period	-0.190646	-0.57876
EAV/TWADA Beginning of the Period	-0.001002	-0.13632

TABLE 2.3

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME
HIGH SCHOOL DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
BEFORE REFORM

Income	Wealth			Row Means
	Low <47,086	Medium	High >61,950	
Low <11,774	0.0426(37)[a]	0.0544(20)	0.1893(27)	.0843
Medium	0.0565(10)	-0.0040(14)	0.1329(06)	.0416
High >14,817	0.0755(01)	0.1317(04)	0.1711(05)	.1417
Column Means	.0515(48)	.0465(38)	.1631(38)	.0765

[a]Numbers in parentheses equal number of districts in the group.

TABLE 2.4

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME
HIGH SCHOOL DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
AFTER REFORM

Income	Wealth			Row Means
	Low <47,086	Medium	High >61,950	
Low <11,774	-0.0179(37)[a]	-0.0330(20)	0.0260(27)	-.0120
Medium	-0.0366(10)	-0.0651(14)	-0.0354(06)	-.0503
High >14,817	-0.1087(01)	-0.0727(04)	0.0352(05)	-.0375
Column Means	-.0321(48)	-.0594(38)	.0063(38)	-.0355

[a]Numbers in parentheses equal number of districts in the group.

TABLE 2.5

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
HIGH SCHOOL DISTRICTS
FISCAL RESPONSE MODEL
BEFORE REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	0.000321	0.02521
Per Cent Increase in Wealth	-0.007903	-0.55378
Per Cent Increase in Revenues Due to Increase in State Aid	-0.011031	-0.30601
Per Cent Increase in Total Revenue	0.008878	0.95412

TABLE 2.6

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
HIGH SCHOOL DISTRICTS
FISCAL RESPONSE MODEL
AFTER REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	-0.003238	-0.30447
Per Cent Increase in Wealth	-0.001771	-0.17620
Per Cent Increase in Revenues Due to Increase in State Aid	-0.000096	-0.01295
Per Cent Increase in Total Revenue	0.000511	0.27424

TABLE 3.1

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
UNIT DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
BEFORE REFORM

Variable	Regression Coefficient	BETA
Median Family Income	0.094536	0.48164
Per Capita Income	-0.059808	-0.09122
Per Cent Urban Population	-0.001008	-0.11754
Per Cent Over $25,000 Income	3.18268	0.21957
Per Cent Under $5,000 Income	0.165840	0.03915
Per Cent Over College	0.631576	0.10432
Per Cent Under Elementary	1.54909	0.43435
Per Cent Professional	-0.580112	-0.08044
Per Cent Blue Collar Workers	0.586920	0.15922
Per Cent Non-White	-0.225611	-0.13380
Per Cent Children	-0.270914	-0.01795
Per Cent Owner Occupied Housing	-1.342330	-0.91770
Operating Tax Rate at the Beginning of the Period	-0.396402	-0.32952
EAV/TWADA Beginning of the Period	-0.005291	-0.08106

TABLE 3.2

WEIGHTED MULTIPLE REGRESSION ANALYSIS OF TAX RATE CHANGES
UNIT DISTRICTS
SOCIO-ECONOMIC LINEAR MODEL
AFTER REFORM

Variable	Regression Coefficient	BETA
Median Family Income	0.103478	0.81708
Per Capita Income	-0.097201	-0.22976
Per Cent Urban Population	0.000946	0.17095
Per Cent Over $25,000 Income	-1.129545	-0.12078
Per Cent Under $5,000 Income	0.711148	0.26017
Per Cent Over College	-0.273923	-0.07012
Per Cent Under Elementary	0.271637	0.11804
Per Cent Professional	-0.059009	-0.01268
Per Cent Blue Collar Workers	-0.837555	-0.35214
Per Cent Non-White	0.406219	0.37336
Per Cent Children	-2.084867	-0.21406
Per Cent Owner Occupied Housing	0.428152	0.45366
Operating Tax Rate at the Beginning of the Period	-0.320721	-0.63780
EAV/TWADA Beginning of the Period	0.007585	0.18279

TABLE 3.3

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME UNIT DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
BEFORE REFORM

Income	Wealth			Row Means
	Low <16,544	Medium	High >20,882	
Low <9,400	0.1126(91)[a]	0.1418(56)	0.1709(91)	.1350
Medium	0.2005(26)	0.5293(19)	0.0709(39)	.4564
High >10,822	0.1318(13)	0.1818(16)	-0.0504(29)	.0430
Column Means	.1405(130)	.4862(91)	.0467(159)	.3309

[a]Numbers in parentheses equal number of districts in the group.

TABLE 3.4

WEIGHTED MEANS OF TAX RATE CHANGES BY WEALTH AND INCOME UNIT DISTRICTS
SOCIO-ECONOMIC INTERACTION MODEL
AFTER REFORM

Income	Wealth			Row Means
	Low <16,544	Medium	High >20,882	
Low <9,400	0.0714(91)[a]	0.0465(56)	0.1216(91)	.0794
Medium	0.0399(26)	0.0176(19)	0.3834(39)	.0568
High >10,822	0.0263(13)	0.1148(16)	0.2011(29)	.1372
Column Means	.0523(130)	.0257(91)	.2355(159)	.0757

[a]Numbers in parentheses equal number of districts in the group.

TABLE 3.5

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
UNIT DISTRICTS
FISCAL RESPONSE MODEL
BEFORE REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	-0.000097	-0.01705
Per Cent Change in Wealth	-0.025724	-0.86698
Per Cent Change in Revenues Due to Change in State Aid	-0.042104	-0.87897
Per Cent Change in Revenues (State and Local)	0.036985	1.66604

TABLE 3.6

WEIGHTED MULTIPLE REGRESSION ANALYSIS
OF CHANGES IN TAX RATES
UNIT DISTRICTS
FISCAL RESPONSE MODEL
AFTER REFORM

Variables	Regression Coefficient	BETA
Per Cent Change in Pupil Count	0.000779	0.02746
Per Cent Change in Wealth	-0.001888	-0.09427
Per Cent Change in Revenues Due to Change in State Aid	-0.005511	-0.49320
Per Cent Change in Revenues (State and Local)	0.000695	0.13975

TABLE 4.1

AVERAGE CHANGES IN TAX RATES
BEFORE AND AFTER REFORM

	Before Reform	After Reform
Elementary Districts	.0870	.0553
High School Districts	.0765	-.0355
Unit Districts	.3309	.0757

IV. QUALIFICATIONS AND LIMITATIONS

Caution must be used in extending the results of this study to the "reward for effort" systems of school finance in other states. While we feel the results of the empirical analysis will be of use to states other than Illinois, no two state "reward for effort" systems are identical. Caution also must be exercised in generalizing the results over a longer period of time in Illinois. The reasons for this caution are the following short-term phenomena existing during the three-year period after reform:

1. The amount of state aid distributed by the formula went up by three hundred and seventy-one million dollars in the three years following the reform. This increase in the amount of state aid must have affected the pattern of tax rate changes.

2. Many districts exerting high tax rates were restricted in taking full advantage of "reward for effort" because the maximum amount of increase in state aid was limited to 25 per cent annually. The districts that could not even get full benefit of their past effort saw no "reward" in any new "effort."

3. The "reward for effort" part of the formula had maximum limits of tax rates beyond which no additional state aid was paid for additional effort. Also, the reform of 1973 had a rollback provision that would force the districts to cut their taxes back to the prescribed limits. This provision had many "escape hatches" built into it, and the provision was later repealed entirely. However, it is conceivable that it scared some districts out of extra tax hikes that would have taken place if the rollback provision had not been in the law in the first three years after the reform was passed.

Because of these reasons, we feel that the full impact of the reward for effort provision in the Illinois school finance system will not be clear until the tax data for a few more years are available. We therefore recommend that the Illinois School Problems Commission repeat this study using data from the fourth and fifth years of the post-reform period. Our experience in Illinois should also alert other researchers who are attempting to assess the effects of DPE systems to the hard fact that it may take much longer to observe the effects of these systems than is commonly thought. Future research designs need to give special consideration to this matter of "time lag" in assessing the effects of grant-in-aid programs.

V. LEGISLATIVE IMPLICATIONS

As this study was being brought to a close, the decision of the Court of Common Pleas in Hamilton County, Ohio, became available in Illinois. Cincinnati vs. Walter (formerly Cincinnati vs. Essex) makes this study even more relevant than we believed when we first proposed the topic to the National Council of State Legislatures. While this decision is still on appeal in Ohio, it seems useful nevertheless to quote liberally from that decision for the benefit of Illinois legislators. The Ohio court found that:

> No rational basis exists for discriminating against school children based on the extent to which the residents of a school district value education. . . . Moreover, equality of educational opportunity will be defeated by any financing formula which relates educational resources to any consideration except educational needs and costs [emphasis ours]. To make the level of educational opportunity available in a district dependent upon the level of interest in education which exists in the school district is as inequitable as it would be to make it depend upon the wealth of the district. . . . The Court also finds that equalizing the taxing capacity of school districts, rather than equalizing the educational opportunities of school districts, is inimical to the concept of equality of educational opportunity. . . . The Court concludes, as a matter of law, that rewarding local tax effort is a constitutionally unacceptable reason for sustaining a discriminatory school finance system. In the matter of education, the obligation of the General Assembly extends to the school children, not to the taxpayers. Education, not tax equity, is guaranteed by the Ohio

> Constitution. Thus, neither a compelling state interest nor a rational basis can be found in that rationale.(19)

The Court then concludes the long, 389-page decision with:

> The evidence shows that a great many school children, who live in the low wealth districts which chronically fail to pass school tax levies, have been consigned by the General Assembly to continue to receive substandard educational opportunities for as long as they attend public schools. . . . Thus O.R.C. # 3317.022, which contains the "reward for effort" feature of the law, enacts a pernicious denial of the right to equal educational opportunity [emphasis ours] guaranteed by Article VI, # 2 of the Ohio Constitution. Neither a compelling state interest nor any rational basis supports it, and the Court concludes that O.R.C. # 3317.022 violates the equal protection clause of Article I, # 2 of the Ohio Constitution and therefore is void and of no effect.(20)

Thus in at least one state in the Union "reward for effort," the subject of our inquiry here, has been tried and found constitutionally wanting.

The authors of this study are not quite as convinced, as was the Ohio Court, that the evidence against the reward for effort provision, at least in Illinois, is absolutely conclusive. At any rate, for the technical reasons indicated throughout this study, it has not been possible for us to show that low income districts are always, and in all cases, discriminated against by the reward for effort provision. Nevertheless, the evidence provided in the earlier Yang and Chaudhari study,(21) plus the evidence indicated now in the empirical portion of this study, has convinced us that a problem exists in low

property valuation/low income districts relative to reward for effort. Acting on that conclusion we shall, in this final section, outline five strategies the General Assembly of Illinois might follow if either of two conditions come to pass: (1) the General Assembly decides of its own volition that they want to do something about the reward for effort provision, or (2) that in the near future an Illinois Court reaches the same conclusion that the Ohio Court did, e.g., that "reward for effort" is repugnant to the state constitution. We are very much aware that neither the Court nor the Legislature in Illinois can wait until school finance researchers obtain conclusive proof relative to the reward for effort provision. The search for "justice" in school finance policy is much too passionate an affair to brook any delay of that kind. Either the Legislature or the Courts may choose to act on what partial evidence we have at this point in time.

Each of the approaches suggested below would have to be computer simulated and the costs of each alternative to the state computed before one could get down to the drafting of new legislation. If the School Problems Commission wishes, the Center at ISU is prepared to assist in this, and we feel sure that the staff of the Illinois Office of Education would cooperate as they always have in the past. The basic problem appears to be the strong

suspicion, now partially supported by research, that low property valuation/low income districts can not increase their tax rates enough to take full advantage of the reward for effort element in the grant-in-aid formula. The strategies outlined below are therefore all aimed at assisting these districts. Let us be open about this matter, however. Most of the strategies below would give these poor districts a "break," relative to the wealthier districts. In the terms we were using in the first part of this study, we would be giving "unearned" advantages to the poor districts while still requiring the wealthy districts to continue to "earn" their state aid by passing tax referenda.

The first strategy the General Assembly has is to simply abolish the reward for effort factor. This is, of course, the most drastic of the five strategies. School districts which currently profit from reward for effort, or especially those districts which hope to profit from reward for effort in the future, might be expected to oppose the repeal of the provision. In our judgment that would include many suburban districts. There are at least two tactical possibilities within this first strategy. The General Assembly could simply mandate a local tax rate up to the current maximum levels which the state will match in the present formula. Given the very unpopular

nature of the property tax we think this an unlikely tactic. If the history of the state-mandated tax rates in the foundation system is any guide, state legislatures have often been reluctant to adjust local property tax rates from the state capital without local voter approval. This tactic would be popular with a good many school people of course, since it would yield revenues from the local side as well as from the state side. A second tactic would be to substitute a "computational" tax rate at the level of the maximum rates now in the formula. Since this "computational" rate would be neither the real tax rate nor a state-mandated rate, the local revenues would not be increased, but state revenues would be increased. This second tactic seems more plausible than the first. Regardless of the tactic selected in removing the reward for effort factor, what will remain when reward for effort is removed is a foundation or Strayer-Haig-Mort system and should be expressed in those terms. In short, removal of the reward for effort factor would return Illinois to the kind of grant-in-aid system it had for forty-six years. However, other aspects of the 1973 reform--for example, the weighting for title one eligible students--could be left in the law.

The other four strategies all retain the reward for effort factor but modify the factor in some fashion.

A second strategy, for example, would be to allow local boards of education the right to tax to the maximum rates used in the formula by board action alone. Indeed, when the "resource equalizer" was first proposed to the General Assembly it was fashioned in exactly this form. However, the "Jacksonian" tradition runs strong in the middle west and it is doubtful that the General Assembly would give this amount of taxing power to local board members. Also, if economic factors are really producing the inability to raise the tax rates in the low property valuation/low income districts, then moving from referenda control of rates to board control of rates may not solve much of the problem. The elected representatives of the voters would be under the same economic pressures that are present now in referenda.

The third strategy uses the notion of a "computational rate" but uses it only for the advantage of poor districts. There are almost limitless permutations and combinations here. For example, one could substitute the average tax rate in the state for the actual tax rate in the district for all those districts below the average property valuation per TWADA and for all districts below the average income per TWADA. One could require that the district be below average on both wealth criteria. Some other point in both wealth distributions might also be

selected. For example, only the districts in the bottom quarter of the property valuation and income distributions might be so favored with "unearned" state aid increases. The difficulty with this tactic is that no solid rationale exists as to which districts should be favored and which should not.

An interesting variation on this approach would make use of the regression models employed in the empirical study reported earlier. The same regression model which yielded the Beta weights can also be used to predict the "expected" tax rates in districts. These regression models could be altered slightly to improve their predictive power and then be used to set a "floor" tax rate below which no district would be allowed to drop for aid purposes. One could create a hypothetical district with a given income, property valuation, socio-economic composition, and so on, and then predict the tax rate expected in that district. This would become the "floor" tax rate and any district below that rate could use this higher "floor" to compute its state aid. A different regression equation would be needed for units, elementaries, and high school districts. Creating the hypothetical district involves some arbitrary judgments, but no more so than simply setting wealth cut-offs below which districts are allowed to use "computational" tax rates.

The fourth strategy assumes that the problem is with low income districts, not low property valuation districts, and therefore reasons that the solution to the problem lies in bringing an income factor into the grant-in-aid formula. Furthermore, this introduction of an income factor should, in our judgment, be done in such a fashion as to help income poor districts while not hurting income wealthy school districts. J. Dan Hou and Warren B. Carson of the Illinois Office of Education have presented a model of this nature.(22) Essentially the Hou-Carson approach would use the income measurement as a multiplier to inflate the tax rates of low income districts and therefore guarantee that these low income districts would participate much more fully in the reward for effort portion of the grant-in-aid system. Hou and Carson explore several specifications of income: per capita income, per weighted student income, median family income, and so on. Basically their approach is similar to the method by which the state of Rhode Island brings an income factor into their grant-in-aid formula. An alternative to the Hou-Carson approach has been provided by Walter W. McMahan.(23) McMahon presents a relatively sophisticated method for combining property valuations with income into a new combined measurement of district wealth. One method would convert property assets into an income flow, and

another alternative would determine the present value of an income stream. McMahon also introduces his new combined wealth measurement into the 1973 reform legislation, converting the present measurement of effort, e.g., the operating tax rate, to an "effective tax rate." He uses the new wealth measurement as the "ability to pay" specification, and provides a computer simulation of this particular proposed reform for all districts in the state. While McMahon does not specifically endorse this tactic, the McMahon approach can also be engineered to perform like the Hou and Carson adjustment; help the income poor, but not hurt the income rich. The matter of introduction of an income measurement into the grant-in-aid formula is too complicated to be dealt with in this study and we have commented upon the notion elsewhere.(24) Perhaps it is sufficient to say that it is not immediately obvious where the votes would come from to bring this introduction about. Neither most suburbs nor most central cities would profit from the introduction of such a variable into the grant-in-aid formula. Rural areas would profit, especially those in the southern part of the state, but the areas that profit the most from the introduction of an income factor do not have the most votes in the General Assembly. The factor might, of course, be introduced as a part of some larger "reform" package.

The fifth strategy would be to reformulate the grant-in-aid system into a "two-tier" type of allocation system. The authors of this study have discussed this possibility for Illinois elsewhere.(25) Such a notion is not new. Various "two" and "three" tier grant-in-aid proposals were put forward in the administration of former governor Ogilvie.(26) The basic idea is to put the foundation system under the present "resource equalizer," and then progressively raise the foundation system upward until the "resource equalizer" becomes simply an add-on over the top of a relatively high foundation approach. The chief limitation upon this strategy is the cost to the state. If the present low foundation level of $520 or something like that figure is placed under the present resource equalizer the cost would be very modest, but nothing much would result in terms of the distribution of funds either. One still might want to do this, since it would make for a more rational and systematic formula in Illinois. Raising the foundation level upward, however, is the part of that strategy that becomes expensive to the state. Still, if there is any one single grant-in-aid system endorsed by most "experts" in the nation, it would probably be this two-tier approach. Normally the "preferred" model consists of: (1) the high foundation level, (2) some local initiative add-on, like the "resource

equalizer," (3) weightings in the general grant-in-aid formula for pupil educational needs, (4) some method for keeping the formula current with inflation, and (5) some method for softening the effect of declining enrollments.(27) A "two-tier" model has recently passed the Missouri legislature and the Illinois legislature may well wish to monitor very carefully the Missouri experience with this type of grant-in-aid.

None of these strategies are without limitations. They all run into either political problems or cost problems or both political and cost problems. All of the above strategies do introduce a certain amount of "paternalism" and a loss of "local control." The first strategy simply raises the level of state aid, under one tactic, or the level of both state and local funds, under the other tactic, regardless of whether or not the districts actually want to do this. The state, in strategy one, is saying to most of the school districts that they are not spending enough for K-12 education and that the state will substitute its "superior wisdom" for their judgment about what ought to be spent. The other four strategies do leave the level of educational funding somewhat more to the local people. The third and fourth strategies are saying to the property valuation/income poor districts that they do not know enough to purchase the right amount of K-12

education and the state will again exercise its "superior wisdom" and determine what level of K-12 education is "good" for these poorer districts. The fifth strategy, at least if carried out as far as many of its proponents would like to take it, would leave the local voters only the power to decide upon some minor "enrichment" of the educational program, while the state determined the basic level of funding. All of this may go down rather hard in a state like Illinois which prides itself on local control, local decision-making, and principles of consumer sovereignty. These values apparently command allegiance even in districts that never have enough money to enrich their program any way.

However, perhaps all five of these proposals are a logical progression from the past. We have, after all, seen fit to remove K-12 education from the private sector and place it in the public sector largely upon the grounds that underconsumption of education by poor families in the private sector would cause serious "spillover" effects in the form of undereducated and underemployable adults. Perhaps local control of educational spending decisions must be at least partially regulated on the same grounds. If before we could not afford for a poor family to underinvest in education, perhaps now we can no longer afford for a poor school district to underinvest in education.

The alternative seems to be "local control with a vengeance" in which all the rewards go to those districts able to pass the tax referenda. What happens to the education of children in a district that repeatedly refuses to pass the necessary referenda and therefore can not participate properly in the state's "reward for effort" system? Do these students not have equal rights under the Fourteenth Amendment of the federal Constitution and under the provisions of most state constitutions? Regardless of the outcome of Cincinnati vs. Walter, these questions are going to remain. The hard fact is that the state can not allow the unbridled exercise of consumer sovereignty in the area of K-12 education. If Illinois were a more sparsely settled rural state, with little dependency of one district upon another, then perhaps most of the spending decisions could remain at the local level. That rustic state of affairs has long since passed. When the products of one school district in Illinois are highly likely to live and seek employment in another school district in the state, then clearly the state has the obligation to see that education in all school districts is "adequate." In an age of interdependency, the answer to the question: "Does a school district have a right to an inferior level of education if the citizens of that district desire that level of education for their children and

their neighbors' children?" is, in all probability: "No longer." Unrestricted local control of educational spending was appropriate for an Illinois that was more rural, more isolated, and perhaps more individualistic. It is not appropriate for an Illinois that is more urban, more interdependent, and more egalitarian.

Five years ago the Phi Delta Kappa national commission on alternative designs for funding education concluded that: "The aspiration level of citizens in a local school district should not be the primary determinant of the level of funding."(28) We are inclined to agree, and do therefore recommend that the School Problems Commission and the General Assembly explore ways in which the "reward for effort" portion of the Illinois grant-in-aid system can be made somewhat less important in the overall funding system.

POSTSCRIPT

After the body of this study had been written one of the authors was able to discuss some of these matters with other school finance researchers at the Ford Foundation/National Institute of Education conference at Tucson, Arizona. These joint Ford Foundation/National Institute of Education invitation conferences, organized by James A. Kelly and Denis P. Doyle, have proven most helpful in enriching all current educational financial research. Two items in particular should therefore be added to this report. One item deals with an additional strategy for school finance legislation, and the other deals with the fundamental research design of the project.

James L. Phelps, associate state superintendent of education for Michigan, pointed out to us that the problem we have observed in Illinois of low income/low property valuation districts not being able to take advantage of the "reward for effort" provision might well be different in those states that have a "circuit breaker" property tax provision that extends to low income groups. As far as we know, there is no conclusive empirical proof of this point; however, it does seem logical that such might be the case.

Accordingly, a sixth strategy might be for the Illinois General Assembly to extend the present property tax "circuit breaker" from the elderly only, to cover low income groups as well. This would increase the progressivity of the property tax and, in addition, the tax credit or tax exemption given the income poor could, and probably would, increase the probability that voters in predominately income poor districts would take advantage of the opportunity to secure additional state revenues by increasing the local property tax rate. The "circuit breaker," properly applied, might also assist the minority poor in districts which would probably increase their tax rates anyway, and therefore might prevent the forced migration of the income poor from the property valuation wealthy and moderately wealthy districts. The principal limitation on such a strategy is the loss of revenue to the state which such a "circuit breaker" would bring about.

Stephen J. Carroll, senior economist with the Rand Corporation, and Phillip E. Vincent, public finance economist with the Education Commission of the States, also pointed out to us that the models used in this study, which employ tax rate changes as the dependent variable, are somewhat different from the models normally employed by investigators seeking to demonstrate the response of districts to educational finance reform. The more

"conventional" econometric model would employ not tax rates, but rather revenues per pupil or expenditures per pupil as the dependent variable, and then seek to construct a "price" variable which would be used as a determinant of expenditures and/or revenues. Price is often specified as locally raised revenues divided by local wealth. The models used here do not, therefore, readily fit into the "supply and demand" frame of reference of standard econometric oriented research. There is no particular reason, of course, that all school finance research should be conducted from a standard econometric frame of reference. As long as the actual tax rate is used in many grant-in-aid formulas, then it is important to learn the determinants of that variable, both at one point in time, and the determinants of change in that variable through time. The full impact of "district power equalization" cannot be estimated without this knowledge. We have attempted to make a small step toward that knowledge here. The utility of a "price" concept in education is surely worth exploration, but that was not the task to which we set ourselves.

NOTES AND REFERENCES

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be found in an annual publication of the Illinois Office of Education entitled: State, Local, and Federal Financing for Illinois Public Schools; this is primarily the work of Fred Bradshaw, Assistant State Superintendent for Finance. Finally, for what amounts to a running account of both school finance studies and school finance problems in Illinois since the early 1950s the reader should be directed to the Reports of the Illinois School Problems Commission; these are primarily the work of Ben C. Hubbard.

3. Michigan State Education Committee, New Equity in Michigan School Finance; The Story of the Bursley Act, 1974, Lansing, Michigan.

4. Augenblick, John G., School Finance at a Second Glance, 1977, Education Commission of the States, Denver, Colorado; the single most authoritative treatment of these reforms is Callahan, John J., and William H. Wilken, School Finance Reform: A Legislator's Handbook, 1976, National Conference of State Legislatures, Washington, D.C.

5. These studies are being conducted by David Ellsworth and Daniel Hou.

6. See for example: Johns, R. L., "Improving the Equity of School Finance Programs," Journal of Education Finance, Spring, 1976; see also Jordan, K. Forbis, and Kern Alexander, "Constitutional Methods of Financing Public Schools" in Alexander, Kern, and K. Forbis Jordan, Constitutional Reform of School Finance, 1972, Institute for Educational Finance, Gainesville, Florida; R. L. Johns has not always been opposed to the concept, however; see: Johns, R. L., Incentive Grant for Quality Education, 1966, Florida Educational Research and Development Council, Gainesville, Florida (available as ED 010 906 in the ERIC service).

7. See especially: Odden, Allan, Phillip E. Vincent, Judy Bellows, and Lora Lee Rice, Report of the Task Force on School Finance of the South Dakota State Board of Education, 1976; also Odden, Allan, Phillip E. Vincent, Judy Bellows, and Lora Lee Rice, Analysis of the School Finance and Tax Structure of Missouri, 1976, Education Finance Center, Education Commission of the States, Denver, Colorado. For an early treatment of these "mixed models" see Hickrod, G. Alan, "Alternative Fiscal Solutions to Equity Problems in

Public School Finance," School Finance in Transition, 1973, Institute for Educational Finance, Gainesville, Florida.

8. Phi Delta Kappa Commission on Alternative Designs for Funding Education, Financing the Public Schools: A Search for Equality, 1973, Phi Delta Kappa, Bloomington, Indiana.

9. Hickrod, G. Alan, and Ben C. Hubbard, Return to the "Two-Tier" Funding Notion in Illinois: A Reexamination of the Basic Rationale for the School Finance Reform of 1973, 1977, Center for the Study of Educational Finance, Illinois State University, Normal, Illinois, 61761.

10. Johns, Roe L., and Ralph B. Kimbrough, The Relationship of Socio-Economic Factors, Educational Leadership Patterns and Elements of Community Power Structure to Local School Fiscal Policy, 1968, U.S.O.E. OE-5-10-146, Washington, D.C.

11. See Hickrod, Hubbard, and Yang, The 1973 Reform, supra.

12. Gensemer, Bruce, Personal Income Variations Among School Districts in Ohio and their Implications for the Guaranteed-Yield Formula, 1976, Education Review Committee, Ohio General Assembly, Columbus, Ohio.

13. Yang, Thomas W. C., and Ramesh Chaudhari, A Study of the Relationship Between Selected Socio-Economic Variables and Local Tax Effort to Support Public Schools in Illinois, 1977, Center for the Study of Educational Finance, Illinois State University, Normal, Illinois, 61761.

14. Feldstein, Martin S., "Wealth Neutrality and Local Choice in Public Education," American Economic Review, March, 1975.

15. See the references in footnote #2.

16. The basic problem here is not with the technique, it is with the specification of "wealth" for large cities. For good discussions of this chron'c urban problem see: Callahan, John J., William L. Wilken, and Tracy M. Sillerman, Urban Schools and School Finance Reform: Promise and Reality, 1973, National Urban Coalition, Washington, D.C.; Berke, Joel S., Answers to Inequity,

1974, McCutchan Publishing, Berkeley, California; Bothwell, Robert O., Richard Johnson, and G. Alan Hickrod, "Geographic Adjustments to School Aid Formulas" in Callahan, John J., and William H. Wilken (eds.), School Finance Reform: A Legislator's Handbook, 1976, National Conference of State Legislatures, Washington, D.C.

17. Bradshaw, Fred, and Others, State, Local, and Federal Financing for Illinois Public Schools, 1977-78, Illinois Office of Education, Springfield, Illinois. The estimate for 1977-78 was 44.65 per cent state aid as opposed to the 1975-76 actual per cent state aid of 48.36. The dramatic increase in the role of the state government in funding schools in Illinois can be easily demonstrated by recalling that in 1966-67 the per cent state aid stood at only 25.04.

18. Letter from R. L. Johns to Thomas Yang dated January 13, 1976.

19. Board of Education of the City School District of the City of Cincinnati, et al. vs. Franklin B. Walter, Superintendent of Public Instruction, et al., Findings of Fact and Conclusions of Law, Court of Common Pleas, Hamilton County, Ohio, December 5, 1977, pp. 285, 286, 304, 379; a summary and analysis of this case is available from William A. Harrison, Jr., Education Review Committee, 20 E. Broad St., Columbus, Ohio, 43215.

20. Ibid., pp. 386-387.

21. Yang, Thomas W. C., and Ramesh Chaudhari, A Study of the Relationship Between Selected Socio-Economic Variables and Local Tax Effort to Support Public Schools in Illinois, 1977, Center for the Study of Educational Finance, Illinois State University, Normal, Illinois.

22. Hou, J. Dan, and Warren B. Carson, Alternative Measures of Local Wealth and Effort, 1977, Illinois Office of Education, Springfield, Illinois.

23. McMahon, Walter W., A Broader Measure of Wealth and Effort for Educational Equality and Tax Equity, 1977, Illinois Office of Education, Springfield, Illinois.

24. See Hickrod, G. Alan, and Ben C. Hubbard, Illinois School Finance Research: Some Knowns and Unknowns, 1977, Center for the Study of Educational Finance, Illinois State University; there is some good empirical research available on this. In addition to the Hou and Carson study, supra, see Hanes, Carol E., and K. Forbis Jordan, "A Multi-Factor Index Technique for State Education Funding," paper presented to the 1976 annual meeting of the American Educational Research Association; see also Firestine, Robert E., "Income and Wealth in a Multi-Variate Classification of School Districts," 1976, Department of Economics, University of Texas at Dallas. The introduction of an income factor can also come through the adoption of a local option income tax for the schools. Both Illinois and Michigan have had legislation introduced on this subject. For a report in opposition to the introduction of a local option income tax in Michigan see: Phelps, James L., and William Sederburg, A Local Income Tax Option, 1977, Department of Education, Lansing, Michigan.

25. Hickrod, G. Alan, and Ben C. Hubbard, Return to the "Two-Tier" Funding Notion in Illinois, 1977, Center for the Study of Educational Finance, Illinois State University, Normal, Illinois.

26. Executive Office of the Governor, A New Design: Financing for Effective Education in Illinois, 1972, Springfield, Illinois.

27. See, for example, chapter eight of Garms, Walter I., James W. Guthrie, and Lawrence C. Pierce, School Finance: The Economics and Politics of Public Education, 1978, Prentice-Hall, Inc.

28. Phi Delta Kappa Commission on Alternative Designs for Funding Education, Financing the Public Schools, 1973, Phi Delta Kappa, Bloomington, Indiana.

APPENDIX A

DEFINITION OF TERMS

After Reform: This term refers to the three-year period 1973-76 in this report.

Assessed Valuation: A valuation determined by a governmental unit upon real property and corporate personal property which provides a basis for levying taxes (see equalized assessed valuation).

Average Daily Attendance (ADA): One unit counted for a pupil who attends school every day for five or more clock hours that school is in session during the computation period. The latter may be for the year or the highest six months. Fractional days of attendance may be counted in some instances; and certain exceptions are allowed in the length of the school day per formal opinion number eight as promulgated by the Superintendent of Public Instruction.

Before Reform: This term refers to the three-year period 1970-73 in this report.

Elementary School District: A school district that encompasses grades pre-kindergarten through eighth grade.

Equalized Assessed Valuation: The total value of the real and corporate personal property of a district as determined by assessment and application of multipliers, calculated, and assigned, by the county board of review and the Department of Local Government Affairs. Theoretically, this system of multiplication "equalizes" property assessments throughout the state (see assessed valuation).

High School District: A school district that encompasses grades nine through twelve.

Operating Tax Rate: A school district's total tax rate less the tax rate for Bond and Interest, Rent, Special Education Construction, Vocational Education Construction, Transportation, and Capital Improvements.

State Aid Formula: The formulas legislated by the General Assembly to survey and to study the problems pertaining to the public schools in Illinois.

Tax Rate Limit: The tax rate limit is the maximum tax rate that the county clerk may extend. The General Assembly authorizes maximum tax rates without referendum. Districts may increase tax rates, within limits, subject to vote approval. A limited number of levies are allowable without a tax rate limit.

Unit District: A school district that encompasses all grade levels (K-12). A term used interchangeably with

a twelve-grade district.

Weighted Average Daily Attendance With Title I Weightings (TWADA): This is the sum total of 0.5 times the number of three-year olds, four-year olds, and kindergarten pupils, 1.00 times the number of pupils in grades one through eight, 1.25 times the number of pupils in grades nine through twelve, and the appropriate total weighting for ESEA--Title 1 eligible pupils depending on the district's per cent of Title 1 eligibles compared to the state average.

APPENDIX B

DESCRIPTIVE STATISTICS OF SELECTED VARIABLES
ELEMENTARY SCHOOL DISTRICTS

Variable	Mean	Standard Deviation	Minimum	Maximum
Median Family Income	13092.2	3377.4	4345.0	32675.0
Per Capita Income	3841.8	1147.9	1279.0	12191.0
Per Cent Urban Population	85.9	28.7	0.0	100.0
Per Cent Over $25,000 Income	8.5	8.6	0.0	61.4
Per Cent Under $5,000 Income	9.2	7.4	2.3	57.1
Per Cent Over College	14.0	10.2	0.0	57.7
Per Cent Under Elementary	20.8	10.6	5.3	73.0
Per Cent Professional	16.5	6.3	0.0	32.5
Per Cent Blue Collar Workers	43.6	13.7	10.5	81.6
Per Cent Non-White Population	4.4	12.1	0.0	95.7
Per Cent Children	14.5	2.2	0.0	34.1
Per Cent Owner Occupied Housing	75.4	12.0	0.0	96.4
EAV/TWADA 1976	33060.9	11350.6	6155.9	77710.3
State Aid/TWADA 1976	527.5	167.1	113.2	952.7
State and Local Revenues 1976	1169.3	206.9	317.1	2256.3
TWADA 1976	1158.6	1634.4	23.8	15212.6

DESCRIPTIVE STATISTICS OF SELECTED VARIABLES
HIGH SCHOOL DISTRICTS

Variable	Mean	Standard Deviation	Minimum	Maximum
Median Family Income	13295.2	3043.3	4798.0	23340.0
Per Capita Income	4022.0	1105.4	1700.0	8160.0
Per Cent Urban Population	87.5	22.9	0.0	100.0
Per Cent Over $25,000 Income	9.5	8.7	0.0	45.1
Per Cent Under $5,000 Income	8.8	6.2	3.6	54.0
Per Cent Over College	14.6	9.9	0.6	45.9
Per Cent Under Elementary	20.6	9.5	7.2	67.3
Per Cent Professional	16.8	5.8	2.8	29.1
Per Cent Blue Collar Workers	42.0	12.8	13.9	71.9
Per Cent Non-White	3.4	5.7	0.0	51.5
Per Cent Children	14.2	1.7	8.2	20.9
Per Cent Owner Occupied Housing	74.6	9.3	37.8	88.6
EAV/TWADA 1976	58937.1	15063.8	17607.2	129344.9
State Aid/TWALA 1976	323.0	173.7	59.7	1269.1
State and Local Revenues 1976	1323.6	250.1	757.8	2085.8
TWADA 1976	2601.9	3413.8	96.7	23089.1

DESCRIPTIVE STATISTICS OF SELECTED VARIABLES
UNIT DISTRICTS

Variable	Mean	Standard Deviation	Minimum	Maximum
Median Family Income	10111.2	1421.5	4778.0	16710.0
Per Capita Income	3217.3	425.5	1572.0	4434.0
Per Cent Urban Population	80.1	32.5	0.0	100.0
Per Cent Over $25,000 Income	4.1	1.9	0.0	17.2
Per Cent Under $5,000 Income	17.7	6.6	0.0	52.8
Per Cent Over College	8.3	4.6	0.0	37.7
Per Cent Under Elementary	31.6	7.8	0.0	64.9
Per Cent Professional	12.6	3.9	0.0	38.0
Per Cent Blue Collar Workers	50.4	7.6	0.0	75.6
Per Cent Non-White	18.5	16.5	0.0	93.0
Per Cent Children	12.6	1.8	0.0	18.6
Per Cent Owner Occupied Housing	53.8	19.1	0.0	87.2
EAV/TWADA 1976	19860.0	4919.1	2788.8	39828.4
State Aid/TWADA 1976	520.6	108.5	149.5	926.5
State and Local Revenues 1976	1060.3	106.1	743.8	1478.4
TWADA 1976	3562.2	30827.2	166.7	648326.4